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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/972,834	10/04/2001	Lawrence A. Loeb	P-UW 4979	5445

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EXAMINER	
FREDMAN, JEFFREY NORMAN	
ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 07/10/2003

DOCKETED
Resp due
10-10-03

Please find below and/or attached an Office communication concerning this application or proceeding.

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PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)	
	09/972,834	LOEB ET AL.	
	Examiner	Art Unit	
	Jeffrey Fredman	1634	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *51-95* is/are pending in the application.

4a) Of the above claim(s) *59-66 and 68-95* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *51-58 and 67* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4)☐ Interview Summary (PTO-413) Paper No(s). _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other:

DETAILED ACTION

Election/Restriction

1. The Applicants election with traverse of the species Arg660Lys is acknowledged. The traversal is on the ground(s) that all of the species were previously examined and no burden of examination exists. Each application is examined on its own merits. The species election is required in order to minimize the extensive burden of verifying the patentability of each of the claimed species. In the event that a generic claim is found to be allowable, the other species will, as required by Markush practice, be rejoined. Therefore, generic claims 51-58 and species claim 67 will be examined. Claims 59-66 and 68-95 drawn to nonelected species are currently withdrawn from examination.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 51-57 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In analysis of the claims for compliance with the written description requirement of 35 U.S.C. 112, first paragraph, the written description guidelines note regarding genus/species situations that "Satisfactory disclosure of a ``representative number"

depends on whether one of skill in the art would recognize that the applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus in view of the species disclosed." (See: Federal Register: December 21, 1999 (Volume 64, Number 244), revised guidelines for written description.)

In the current case, Applicant has one common attribute, the presence of a mutation in the O-helix. However, all of the current claims encompass a genus of nucleic acids which are different from those disclosed in the specification, since the claims are not limited to any particular SEQ ID NO, but are open to any polymerase with a mutated O-helix without any structural limitations on the polymerase sequence whatsoever.

Most significantly, the claimed genus includes variants for which no written description is provided in the specification. Given a broad reading of the term "thermostable" to read on any polymerase that is stable at some temperature, then the current claim reads on every possible polymerase mutation in an O-helix of every possible polymerase which results in higher fidelity. In the exemplified situation, there are 12 amino acids, from positions 659-671 in the O-helix. Thus, at the protein level, there are 20^{12} (or 4,096,000,000,000,000) different possible naturally occurring amino acid arrangements in this O-helix which meet the claimed structural limitation of having one or more mutated amino acids. Applicant has express possession of only 18 particular sequences which result in higher fidelity in a genus which comprises

4,096,000,000,000,000 different possibilities: There is no evidence that these 18 embodiments are representative of the entire range of possible sequences.

There is no showing or evidence which links structural limitations regarding specific single or multiple mutations of the O-helix to the particular functional limitations of higher fidelity. That is, there is no theory or method taught by Applicant which permits selection of higher fidelity mutants, without testing, from the 4,096,000,000,000,000 different possibilities of total mutation in the O-helix.

It is noted in the recently decided case The Regents of the University of California v. Eli Lilly and Co. 43 USPQ2d 1398 (Fed. Cir. 1997) decision by the CAFC that

> "A definition by function, as we have previously indicated, does not suffice to define the genus because it is only an indication of what the gene does, rather than what it is. See Fiers, 984 F.2d at 1169- 71, 25 USPQ2d at 1605- 06 (discussing Amgen). It is only a definition of a useful result rather than a definition of what achieves that result. Many such genes may achieve that result. The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See In re Wilder, 736 F.2d 1516, 1521, 222 USPQ 369, 372- 73 (Fed. Cir. 1984) (affirming rejection because the specification does "little more than outlin[e] goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate."). Accordingly, naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material. "

In the current situation, the definition of the proteins as having a mutation in the O-helix and higher fidelity lacks any specific structure which is correlative with the function. While many such materials or proteins may exist, in a genus of 4,096,000,000,000,000

different possibilities, the current claim only defines what would be a useful result, rather than defining the result itself, as required by Lilly.

It is noted that in Fiers v. Sugano (25 USPQ2d, 1601), the Fed. Cir. concluded that

> "...if inventor is unable to envision detailed chemical structure of DNA sequence coding for specific protein, as well as method of obtaining it, then conception is not achieved until reduction to practice has occurred, that is, until after gene has been isolated...conception of any chemical substance, requires definition of that substance other than by its functional utility."

The current situation is a definition of the polymerase that is claimed solely by the functional utility of having higher fidelity without any additional structural limitations. In fact, since the particular polymerase sequence is not required in any of these claims, there are no structural limitations whatsoever on the polymerase. That is, while the previous arguments have accepted, arguendo, that the region outside the O-helix is defined, this is not in fact true. The claim includes no definition or requirement for regions outside the O-helix, so that no structure is given whatsoever for the polymerase. The claim is defined solely in functional terms.

In the instant application, certain specific mutations are described. Also, in Vas-Cath Inc. v. Mahurkar (19 USPQ2d 1111, CAFC 1991), it was concluded that:

> "...applicant must also convey, with reasonable clarity to those skilled in art, that applicant, as of filing date sought, was in possession of invention, with invention being, for purposes of "written description" inquiry, whatever is presently claimed."

In the application at the time of filing, there is no record or description which would demonstrate conception of any nucleic acids other than those expressly disclosed which comprise mutations in the wildtype Taq polymerase sequence. Therefore, the claims fail to meet the written description requirement by encompassing 4,096,000,000,000,000 different possible O-helix sequences and proteins which are not described in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 51-58 and 67 are rejected under 35 U.S.C. 102(a) as being anticipated by Suzuki et al (Proc. Natl. Acad. Sci. (September 1996) 93:9670-9675).

Suzuki teaches a composition comprising a thermostable (see abstract, Taq polymerase is used) polymerase comprising a Arg660Lys mutation in the O-helix (see page 9672, figure 3, where the Arg660Lys mutations is listed). The Thermostable polymerase with the Arg660Lys mutation was mixed with template nucleic acids in cells (see page 9671, column 1, subheading "genetic complementation") to form the claimed composition.

With regard to the limitation that the mutation have "higher fidelity", MPEP 2112.02 notes ""Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable.

Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present." In the current case, the prior art reference of Suzuki teaches a composition of identical structure to that claimed. Consequently, Suzuki inherently anticipates the functional limitation.

Double Patenting

3. Claims 51-58 and 67 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 16-29 and 51-84 of U.S. Patent No. 6,395,524. Although the conflicting claims are not identical, they are not patentably distinct from each other because the current claims simply require the addition of a template nucleic acid to the polymerase which is prima facie obvious because polymerases operate only on templates and therefore mixing the polymerase with a template is prima facie obvious.

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Fredman whose telephone number is 703-308-6568. The examiner can normally be reached on 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 703-308-1119. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Jeffrey Fredman
Primary Examiner
Art Unit 1637

July 1, 2003